TRAC-Monterey Staff Notes
November 2006

I. Advancements in Modeling and Simulation

A) Urban Operations Focus Area Collaborative Team, Project Code 623

Finalized list of UO FACT projects for FY07 has been submitted. No date has been set for the ACR Summit, the next step in the FACT process. The draft agenda for the UO Summit has been completed. Once speaker participation is confirmed the agenda will be finalized. The summit will take place 16-18 January 2007 in Portsmouth, Virginia. POC is MAJ Jon Alt, DSN 756-3732, email jonathan.alt@us.army.mil

Continued to pursue development of a supporting effort related to the UO FACT. The purpose of this supporting effort is to ensure, as appropriate, that these past efforts are widely shared and implemented in the larger modeling and simulation community. Working groups at this year's UO Summit are based on this years UO FACT's CRAs and will be tasked to take the first steps in executing this effort. POC is MAJ Jon Alt, DSN 756-3732, email jonathan.alt@us.army.mil

B) Modeling Close Range, Quick Reaction Engagements, Project Code 675

Status of this work and methodology was briefed to representatives from the Soldier FACT at TRAC-WSMR, AMSAA and Natick Labs. The post combat survey to be executed with the DCD at Fort Benning continued to be refined. A draft experimental design was completed for data collection to be conducted at the Soldier Battle Lab in February, in their virtual environment systems. POC is MAJ Jon Alt, DSN 756-3732, email jonathan.alt@us.army.mil

C) Dynamic Sustainment Modeling in Support of Battle Command Analysis, Project Code 659

Continued code maintenance of DS in support of LEE and NPS supporting research efforts. LtCdr Pamela Dozier continued her An NPS Operations Logistics research report and analysis of data from DS model runs. She identified an issue with matching scenario length to data collection times and the DS code was modified to prevent future mismatches. POC is Mr. Jack Jackson, DSN 756-3087, email: Leroy.Jackson@us.army.mil

D) Logistics Battle Command M & S, Project Code 676

Reviewed the object model and approved it as a basis for coding the rapid prototype; began coding the rapid prototype and expect to complete that in DEC. Began drafting the representation of the distribution network and made basic decisions related to its implementation. Two NPS research efforts are now supporting the LBC project. LtCdr Roger Musselman attended the Project Albert workshop and is working on decision making and behavior representation. LtCdr Tony Costa studied the SBC white paper and coordinated to visit San Diego in early DEC in support of his research. POC is Mr. Jack Jackson, DSN 756-3087, email: Leroy.Jackson@us.army.mil

E) Dynamic Allocation of Fires and Sensors (DAFS), Project Code 645

Re-implementing and validating the four AMSAA approved ways of determining direct and indirect probability of kill from munitions. Completed input database changes and implementation of data structures. Algorithmic implementation is ongoing. Continue

planning for a design of experiments interface that identifies factors and appropriate ranges for those factors and implements runs for the resulting design on a computing cluster. Completed improve movement manager to more accurately model offensive operations.

Continuing to support joint fires study by NPS systems engineering research group to include communications flow and kill chain modeling. Implementing new assignment formulation to assign fires along with differing communications flow and kill chain models to represent transition from current operations to potential future force operations. Study will be executed July-December 06. Implemented range based mediator using NVTherm output for Crane Naval Surface Warfare research group.

Exploring study support opportunities with TRAC-WSMR. POC is MAJ Darryl Ahner, DSN 756-7574, email: Darryl.Ahner@us.army.mil

F) UAV Mix Tool for Force Modularity, **Project Code 309**

Determining potential for integration of future force network-enabled fires methodology into UAV tools. Exploring improved representation of manned/unmanned systems trade-offs.

In a supporting research effort, Maj Derek Oliver, USAF, is developing a transshipment formulation for UAV assignments to better determine AV path feasibility. Additionally, he is developing a design of experiments front end to more effectively use automation to determine appropriate ASC-U analysis runs.

POC is MAJ Darryl Ahner, DSN 756-7574, email: Darryl.Ahner@us.army.mil

II. Advancements in Analysis Techniques and Methodologies

A) Objective OneSAF System (OOS) Behavior Model Analysis, Project Code 666

Conducted project summary brief to PM OneSAF Objective System. In preparation for future work, conducted coordination with PM OOS personnel to discuss future project ideas. Background research was also conducted to identify behavior modeling capabilities within OOS and to explore the OOS Behavior Composer Tool. PM OOS documentation and tutorials explored and coordination for future OOS training events in December and January conducted. POC is CPT Michael Martin, DSN 756-7580, email michael.martin9@us.army.mil

B) Rapid Equipping Force (REF) Analysis Methodology, Project Code 670

LCDR Higgins and LT Mack traveled to the REF to demonstrate their human systems integration (HSI) tool to the REF Assessments group. The tool, designed as an Expert System, can be used to support the comparison of potential alternatives and the generation of assessment surveys from a human performance perspective. Later in the month, MAJ Tollefson traveled to the REF to conduct the first major In Progress Review (IPR) with members of the REF leadership. We received very positive feedback on our efforts and recommendations for our continued effort. Current concept includes, in addition to the above: methodology for quick turnaround analysis of REF materiel alternatives, an overall analysis of REF processes, the development of a rapid acquisition analysis support system, and the development of a rapid ordering and contracting support system. POC is MAJ Eric Tollefson, DSN 756-7578, email: Eric.Tollefson@us.army.mil

C) Soldier Representation in M&S, Project Code 615

MAJ Tollefson met with PEO Soldier to discuss the development of a new project that leverages the related work we have been doing in support of Soldier M&S. He also met with members of AMSAA to coordinate ongoing Soldier M&S efforts. Additionally, we have taken the first steps towards developing a Soldier M&S website that will serve as a line of communication between Soldier M&S executors and consumers. We expect have a prototype in December and a limited launch in January. We are continuing to pursue students and faculty to work on Soldier M&S topics. TRAC-MTRY provided a briefing to TRAC-WSMR to coordinate and review soldier, small combat unit, and other modeling and analysis efforts that TRAC-WSMR can leverage for their future study efforts. TRAC-MTRY M&S efforts POC is MAJ Eric Tollefson, DSN 756-7578, email: Eric.Tollefson@us.army.mil

D) Individual Soldier Close Combat Skills and Activities, Project Code 525

Results were briefed to partners at AMSAA. The developed algorithms were also briefed to IWARS proponents and developers. The draft technical report is complete and waiting final approval. POC is MAJ Jon Alt, DSN 756-3732, email jonathan.alt@us.army.mil

E) High Performance Computing Clusters and Design of Experiments, Project Code 681

Coordinated with project leads for support to develop capabilities for specific models and to leverage work to contribute to common DOE tools. Identified NPS ITM interest in research to support data modeling for HPCC database support. LTC Schamburg met with Dr. Gary Horne, Director of Project Albert, to initiate coordination of International Data Farming Workshop (IDFW) groups in support of TRAC research efforts. POC is Mr. Jack Jackson, DSN 756-3087, email: Leroy.Jackson@us.army.mil

F) M&S/OR Advancements, Project Code 639

New OneTESS Support Project. Attended the TNT experiments to be conducted during the first week of November at Camp Roberts to observe the scenario test capability provided by the Camp Roberts facility and to present the Geocast Algorithm during engineering day presentations. The Geocast Algorithm is a new routing mechanism designed for peer-to-peer networks in which all nodes are presumed to have access to GPS position information. The algorithm routs messages geographically rather than traditional internal network connectivity and is believed by the AT&T team to have wide application in future military networks. In addition funding sponsorship from Ft. Hood (POC Todd Campbell) is being secured to allow TRAC/NPS to support the OneTESS program through the TRAC based Synthetic Environment Lab and wireless performance analysis is proceeding on track. POC is CPT Michael Martin, DSN 756-7580, email: michael.martin9@us.army.mil

CSM(R) Steve Burnett completed his NetLogo simulation analysis for his research in "Modeling Macro-Cognitive Influence on Information Sharing between Members of a Joint Team." The joint team model and the analysis have been used to improve representation of joint teams. Furthermore, this work provides insights for

improving joint team effectiveness. CSM(R) Burnett briefed his developed methodology and the results of his analysis at NPS. POC is LTC Jeff Schamburg, DSN 756-3086, email: Jeffrey-Schamburg@us.army.mil

III. Future Systems Applied Research

A) Future Force Warrior (FFW) Capabilities Analysis, Project Code 220

Representatives from PEO-Soldier and the IWARS proponents and developers were briefed on the results of this work. This work used high performance computing clusters, agent based models, IWARS and large experimental designs to examine the validity of projected FFW TTP's and potential capability distributions across the FFW small combat unit. The results of this analysis were consistent with concurrent analysis conducted by the FFW programs analysis and experimentation team. The draft technical report is complete. POC is MAJ Jon Alt, DSN 756-3732, email jonathan.alt@us.army.mil

B) Land Warrior/Mounted Warrior DOTMLPF Assessment, Project Code 105

We are continuing to lead the questionnaire and interview portion of the Assessment. The focus of this month was the continued entry of the questionnaire data into the database. We finished the data entry and delivered the database on 20 November. In addition to data entry, we conducted analysis to find data entry errors and characterize the error rate. We are now focused on providing data summaries for the questionnaire responses and conducting additional analyses. POC is MAJ Eric Tollefson, DSN 756-7578, email Eric.Tollefson@us.army.mil

C) Multi-Purpose Enterprise Simulation Suite (MPESS), Project Code 673

Continued functional analysis and development of alternative concepts for Future Army M&S Strategy. Primary effort was on finalizing the alternatives to define a spectrum of options in providing required functions. Working sessions conducted to identify common items of comparison between the alternatives, and to flush out ideas in how the alternatives should be developed and quantified. Additional work conducted on recruiting Subject Matter Experts for objective evaluation of alternatives and in defining quantifiable metrics for alternatives, as well as an ongoing review and reiterative analysis of the system functional decomposition. Also conducted IPRs with the previous sponsor, COL Stone, and his successor, COL O'Connor. POC is CPT Michael Martin, DSN 756-7580, email: michael.martin9@us.army.mil

D) Common Maneuver Networks (CMN), and Mobility Common Operational Picture (MCOP), Project Code 660

Project deliverables are complete. Primary efforts consisted of finalizing documentation for this project. The user's guide for the software was completed and delivered to the sponsor, and a technical document was written covering the use of A* and Dijkstra's algorithms in path finding. Final technical report is undergoing review. POC is CPT Michael Martin, DSN 756-7580, email: michael.martin9@us.army.mil

E) Sensor to Commander Metrics, Project Code 677

Continuing to develop initial mathematical model framework to describe information flow in the Conceptual Model of Situated Cognition with appropriate feedback filters. Categorized data from NPS TNT experiments and DARPA M&D C2 Experiment 7A using the conceptual model for use in refining mathematical model.

LTC Donovan Phillips and LTC(R) Bard Mansager are 1) developing probability models of processing time and integrating model dynamics, 2) developing value functions of information and 3) developing control mechanisms that affect information flow. POC is MAJ Darryl Ahner, DSN 756-7574, email: Darryl.Ahner@us.army.mil